

REMARKS/ ARGUMENTS

The Office Action of March 2, 2004 has been carefully reviewed and this response addresses the Examiner's concerns.

Status of the Claims

Claims 1-18 were pending in this application.

Claims 1-18 were rejected.

Claims 1, 4-7, 10-13 and 16-18 were rejected under 35 U.S.C. 102(a) as being anticipated by Stone 5,892,620.

Claims 1, 4-7, 10-13 and 16-18 were rejected under 35 U.S.C. 102(b) as being anticipated by Weverka 5,165,104 or Brenner et al. 4,931,959.

Claims 2, 3, 8, 9, 14 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Weverka 5,165,104 or Brenner et al. 4,931,959.

Claims 1, 3, 7, 9, 13, and 15 are amended.

Claims 2, 8, and 14 are cancelled without prejudice.

Claims 19-23 are added.

Added claims 19-20 are dependent on Claim 3 and provide the same limitations as claims 4-5 provide for claim 1. Added claims 21-22 are dependent on Claim 9 and provide the same limitations as claims 10-11 provide for claim 7. Added claim 23 is dependent on Claim 15 and provide the same limitations as claims 16-17 provide for claim 13.

The 35 U.S.C. §102 rejections

Claims 1, 4-7, 10-13 and 16-18 were rejected under 35 U.S.C. 102(a) as being anticipated by Stone 5,892,620.

Amended Claim 1 includes the limitations of claim 2. That is, amended claim 1 claims an imaging system defining an input plane and an output plane, the imaging system being in the form of a gradient index rod lens. Similarly, amended Claim 7 includes the limitations of claim 8 and amended Claim 13 includes the limitations of claim 14, in all of which the imaging system is in the form of a gradient index rod lens or an optical data pipe. The Stone 5,892,620 patent does

not disclose either gradient index rod lenses in the imaging system or the imaging system being in the form of an optical data pipe or gradient index rod lens. Therefore, amended claims 1, 7, 13 are not anticipated by the Stone 5,892,620 patent.

The second limitation of claim 1, namely, "means affixed to said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane," the second limitation of claim 7, namely "means incorporated into said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane," and the second limitation of claim 13, namely, "means affixed to said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane," are expressed in means plus function form (limitations according to 35 USC 112, Sixth paragraph, MPEP 2181). The structures in the specification that accomplish the claimed function in the second limitation of claims 1, 7 and 13 are described in paragraph 101, pages 29-30 and Figure 16 (first structure), in paragraph 103, page 30 and Figure 17 (second structure), paragraphs 104 and 105, page 31 and Figure 18 (third structure), and paragraph 106, pages 31-32 and Figure 19 (fourth embodiment). The description of the way in which the means for rearranging spatial components of an object located proximate the input plane operate is given in paragraphs 35-58, pages 8-15. Since in the Applicant's present invention, the means for rearranging spatial components are affixed to the imaging system in one claimed embodiment and are incorporated in the imaging system in another claimed embodiment, as shown in Figs. 16-19, the means for rearranging spatial components of this invention result in alignment insensitivity, a result absent in the 5,892,620 patent.

Furthermore, the means for rearranging spatial components of this invention are designed to be attachable to or incorporated into GRIN rod lenses (which are not commercially available in sizes of more than several millimeters in diameter) or optical pipes. The means for rearranging spatial components disclosed in the 5,892,620 patent ('620 patent) can be utilized with macro-optics. In the macro-optic (or large format applications) applications of the '620 patent,

modifying the '620 patent in order to obtain the features of the present invention, would render the '620 patent inoperable for some of its intended functions, the large format functions. (As an analogy, consider the modifying of the camera by replacing the camera lens with a GRIN rod lens having the same optical properties except for the aperture size. The modified camera would be rendered inoperable for the intended purpose of taking large format pictures.)

To support Applicant's contention that the present claimed invention is patentable over the '620 patent (Stone), reference is made to section 2131 of the MPEP.

To anticipate a claim a reference must teach every element of the claim. (MPEP § 2131). Based on the above stated deficiencies of the '620 patent, Applicant respectfully asserts that amended Claims 1, 7 and 13 are not anticipated by the '620 patent (Stone). In addition, even a 35 USC 103 rejection would fail, since the '620 patent is lacking at least one patentable feature present in amended Claims 1, 7 and 13 and a modification of the '620 patent under 35 U.S.C. §103 would also be inapplicable because such modifications are not taught by nor obvious under the '620 patent, and if incorporated into the '620 patent, would render the '620 patent inoperable for some of its intended functions.

Since claims 4-6 depend on amended claim 1, claims 10-12 depend on amended claim 7, and claims 16-18 depend on amended claim 13, Applicant also respectfully asserts that amended Claims 4-6, 10-12 and 16-18 are neither anticipated by the '620 patent (Stone) or obvious variants of the '620 patent.

Claims 1, 4-7, 10-13 and 16-18 were rejected under 35 U.S.C. 102(b) as being anticipated by Weverka 5,165,104 or Brenner et al. 4,931,959.

Neither the Weverka 5,165,104 patent (the '104 patent) nor the Brenner et al. 4,931,959 patent (the '959 patent) disclose an imaging system [is] in the form of a gradient index rod lens or an optical data pipe. Therefore, Applicant respectfully asserts that amended claims 1, 7, 13 are not anticipated by the '104 patent or the '959 patent, since neither the '104 patent nor the '959 patent

teaches the first limitation of amended claims 1, 7, 13, an imaging system [is] in the form of a gradient index rod lens or an optical data pipe.

Regarding the second limitation of claim 1, the second limitation of claim 7 and the second limitation of claim 13 are expressed in functional form (limitations according to 35 USC 112, Sixth paragraph, MPEP 2181). 35 U.S.C. 112, sixth paragraph states that a claim limitation expressed in means-plus-function language "shall be construed to cover the corresponding structure described in the specification and equivalents thereof." (MPEP 2181) The structures in the specification that perform the claimed function have refractive or diffractive surfaces, inclined at an angle in the vicinity of the image plane, which are typically symmetric and "take on the appearance of a "tent" or wedge with a base resting on the image plane." (paragraph 40, page 9, or Fig. 16). The claimed invention, the structures in the specification and equivalents thereof, does not include Fourier transform lenses or collimating lenses.

The '104 patent

Contrary to the Applicant's claimed invention, in the '104 patent, lenses (39, 43) and/or Bragg cell 41 operate as a structure providing means to rearrange spatial components ('104 patent, Fig. 1, col. 5, lines 11-42). During operation of the structure for rearranging spatial components described in the '104 patent, signals from input plane are Fourier transformed by lens 39 resulting in a set of collimated beams incident on Bragg cell 41. The Bragg cell 41 directs the collimated light from one of the inputs towards a selected output. The second lens 43, also a Fourier transform lens, focuses the acoustically-redirected diffracted optical waves onto the destination output. There is no element or design principle in the '104 patent that leads to alignment insensitivity. The '104 patent is silent as to alignment insensitivity.

In the Applicant's claimed invention, the structures disclosed in the specification for rearranging spatial components do not require the use Fourier transform lens elements, collimating elements or Bragg cells. The Applicant's disclosed structure for rearranging spatial components does not operate in the same way as the structure for rearranging spatial components described in the '104

patent, since the present invention does not require the use of Fourier transform lens elements, collimating elements or Bragg cells.

Since in the Applicant's invention, the means for rearranging spatial components are affixed to the imaging system in one embodiment and are incorporated in the imaging system in another embodiment, as shown in Figs. 16-19, the means for rearranging spatial components of this invention result in alignment insensitivity, a result absent in the '104 patent. The Applicant's disclosed structure for rearranging spatial components does not produce the same result as the structure for rearranging spatial components described in the '104 patent since the '104 patent does not result in alignment insensitivity.

As stated in section 2184 of the MPEP, one indicator of equivalence between two structures that perform the same function (for the purposes of 35 U.S.C. 112, sixth paragraph) is "whether the prior art element performs the identical function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in the specification." *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000) (MPEP 2184). The Applicant's disclosed structure for rearranging spatial components does not operate in the same way and does not produce the same result as the structure for rearranging spatial components described in the '104 patent, as described in the preceding paragraphs.

Another indicator of equivalence between two structures that perform the same function (for the purposes of 35 U.S.C. 112, sixth paragraph) is "whether there are insubstantial differences between the prior art element and the corresponding element disclosed in the specification." *IMS Technology, Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1436, 54 USPQ2d 1129, 1138 (Fed. Cir. 2000); *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 117 S. Ct. 1040, 41 USPQ2d 1865, 1875 (1997) (MPEP 2184). The lack of the Fourier transform elements, collimating elements and Bragg cells (as required in the '104 patent) in the Applicant's disclosed structure are substantial differences.

Therefore, Applicant respectfully asserts that the structures disclosed in the specification for rearranging spatial components are not equivalent to lenses (39, 43) and Bragg cell 41 in the '104 patent and the second claimed limitation of claim 1, the second limitation of claim 7 and the second limitation of claim 13 are not present in the '104 patent.

To anticipate a claim a reference must teach every element (limitation) of the claim. (MPEP § 2131). Applicant respectfully asserts that amended Claims 1, 7 and 13 are not anticipated by the '104 patent (Weverka). In addition, the Weverka patent would not support a 35 USC 103 rejection since the '104 patent is lacking at least one patentable feature present in amended Claims 1, 7 and 13, a modification of the '104 patent under 35 U.S.C. §103 would also be inapplicable because such modifications are not taught by nor obvious under the '104 patent, and if incorporated into the '104 patent, would render the '104 patent inoperable for its intended functions, as further elucidated below.

The '959 patent

Contrary to the Applicant's claimed invention, in the '959 patent, deflecting prisms (405, 410, 420, 425), Fourier transform lenses (415, 430) operate as a structure providing means to rearrange spatial components ('959 patent, fig. 4, col. 4, lines 1-42). During operation of the structure for rearranging spatial components described in the '959 patent, signals from the upper half of the input plane are deflected upward by prism 405 while elements signals from the lower half of the input plane are deflected downward by prism 410. The parallel deflected beams originating at the upper half of the input plane are applied to the upper half of Fourier transform lens 415. "Lens 415 is adapted to direct these beams to point 445 on the vertical side of prism 420 a distance F1 from vertical center line 460 of the Fourier transform lens." In similar manner, the signals originating at the lower half of the input plane are applied to "the lower half of lens 415 so that they are directed to point 450 on the vertical side of prism 425. The vertical sides of prisms 420 and 425 are located at distances F2 from the vertical side of inverse Fourier lens 430 and the prisms are operative to deflect the beams passing through points 445 and 450 outwardly from center axis 440." Consequently, the beams for signals originating at the upper half of the input plane are "redirected by inverse Fourier lens 430 and form parallel beams upon leaving the

inverse Fourier transform lens. These parallel beams are angled downwardly to intersect center axis 440." The direction of the beams for signals originating at the lower half of the input plane "is altered by inverse Fourier transform lens 430 so that these form a set of parallel beams at an angle that upwardly intersects center axis 440. The prism angles, the Fourier and inverse Fourier lens, and the distance F1 and F2 are arranged so that" the information elements at output image plane 435 are in shuffled order. ('959 patent, col. 4, lines 1-42)

In the Applicant's claimed invention, the structures disclosed in the specification for rearranging spatial components do not use Fourier transform lens elements or multiple prisms. The structures in the specification that perform the claimed function have refractive or diffractive surfaces, inclined at an angle in the vicinity of the image plane, which are typically symmetric and "take on the appearance of a "tent" or wedge with a base resting on the image plane." (paragraph 40, page 9, or Fig. 16). The Applicant's disclosed structure for rearranging spatial components does not operate in the same way as the structure for rearranging spatial components described in the '959 patent, since the Applicant's invention does not require Fourier transform lens elements, inverse Fourier transform lens elements, or multiple prisms.

Since in the Applicant's invention, the means for rearranging spatial components are affixed to the imaging system in one embodiment and are incorporated in the imaging system in another embodiment, as shown in Figs. 16-19, the means for rearranging spatial components of this invention result in alignment insensitivity, a result absent in the '959 patent. In the '959 patent, the operation of the structure for rearranging spatial components depends on the distances F1 and F2 between the prisms and the Fourier transform lenses. Alignment, as in many optical systems, is necessary for proper operation. The Applicant's disclosed structure for rearranging spatial components does not produce the same result as the structure for rearranging spatial components described in the '959 patent, since the '959 patent does not result in alignment insensitivity .

The second limitation of claim 1, the second limitation of claim 7 and the second limitation of claim 13 are expressed in means plus function form (limitations according to 35 USC 112, Sixth paragraph, MPEP 2181). 35 U.S.C. 112, sixth paragraph states that a claim limitation expressed

in means-plus-function language "shall be construed to cover the corresponding structure described in the specification and equivalents thereof." (MPEP 2181) One indicator of equivalence between two structures that perform the same function (for the purposes of 35 U.S.C. 112, sixth paragraph) is "whether the prior art element performs the identical function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in the specification." The Applicant's disclosed structure for rearranging spatial components does not operate in the same way and does not produce the same result as the structure for rearranging spatial components described in the '959 patent, as described in the preceding paragraphs.

Another indicator of equivalence between two structures that perform the same function (for the purposes of 35 U.S.C. 112, sixth paragraph) is "whether there are insubstantial differences between the prior art element and the corresponding element disclosed in the specification." The lack of Fourier transform element pairs or multiple prisms (as required in the '959 patent) in the Applicant's disclosed structure are substantial differences.

Therefore, Applicant respectfully asserts that the structures disclosed in the specification for rearranging spatial components are not equivalent to deflecting prisms (405, 410, 420, 425), Fourier transform lenses (415, 430) in the '959 patent and the second claimed limitation of claim 1, the second limitation of claim 7 and the second limitation of claim 13 are not present in the '959 patent.

To anticipate a claim a reference must teach every element (limitation) of the claim. (MPEP § 2131). Applicant respectfully asserts that amended Claims 1, 7 and 13 are not anticipated by the '959 patent (Brenner et al.) since the '959 patent lacks at least the first and second limitations of amended Claims 1, 7 and 13 of the Applicant's invention. In addition, since the '959 patent is lacking at least one patentable feature present in amended Claims 1, 7 and 13, a modification of the '959 patent under 35 U.S.C. §103 would also be inapplicable because such modifications are not taught by nor obvious under the '959 patent, and if incorporated into the '959 patent, would render the '959 patent inoperable for its intended functions, as further described below.

The 35 U.S.C. §103 rejections

Claims 2, 3, 8, 9, 14 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Weverka 5,165,104 or Brenner et al. 4,931,959.

Although Claims 2, 8 and 14 have been cancelled, the limitations of Claims 2, 8 and 14 have been incorporated into amended Claims 1, 7, 13 respectively. The remarks given below address the Examiner's concerns in regards to the limitations corresponding to original claims 2, 8 and 14 as now incorporated in Claims 1, 7, 13 respectively.

As stated above, Applicant respectfully asserts that the structures disclosed in the specification for rearranging spatial components are not equivalent to lenses (39, 43) and Bragg cell 41 in the '104 patent, and are also not equivalent to deflecting prisms (405, 410, 420, 425), Fourier transform lenses (415, 430) in the '959 patent and the second claimed limitation of claim 1, the second limitation of claim 7 and the second limitation of claim 13 are not present in the '104 patent or '959 patent.

Furthermore, assuming arguendo that the imaging systems in Weverka (the '104 patent) and/or Brenner et al. (the '959 patent) are modified by utilizing the gradient index rod lens and/or an optical data pipe, the modifications would render the '104 patent and the '959 patent inoperable for their intended functions, as is described below.

The '104 patent

Furthermore, Weverka (the '104 patent)) discloses an optical connection system comprising an imaging device having a first component (23) and a second component (31). One of the objects of the Waverka invention is to provide an acoustooptic interconnecting device which includes an acoustooptic substrate, the device being formed in the substrate (the '104 patent, col. 4, lines 26-35). Utilizing the gradient index rod lens and/or an optical data pipe in the imaging device of the '104 patent, an imaging device having a first component (23) and a second component (31), would render the device not amenable to being formed in the substrate (since the gradient index

rod lens would have to be rendered two dimensional) and therefore inoperable for that intended function.

The '959 patent

The '959 patent discloses an imaging device having a first component or input plane (401) spaced apart from a second component or output plane (435). The means for rearranging spatial components disclosed in the '959 patent can be utilized with macro-optics (or large format). In the macro-optic applications of the '959 patent, modifying the imaging device in the '959 patent in order to obtain the features of the claimed present invention, would render the '959 patent inoperable for its intended functions. (As an analogy, consider the modifying of the camera by replacing the camera lens with a GRIN rod lens having the same optical properties except for the aperture size. The modified camera would be rendered inoperable for the intended purpose of taking large format pictures.)

"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)." MPEP 2143.01

Under a 103 rejection, a *prima facie* case of obviousness of the invention must be made in view of the scope and content of the prior art. In order to establish a *prima facie* case of obviousness, "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references) must teach or suggest all of the claim limitations." M.P.E.P. § 2143.

Applicant respectfully asserts that the neither the '104 patent nor the '959 patent contains all the limitations either Claim 1, 3, 2, 9, 13 or 15, as described in the preceding paragraphs. Furthermore, since modifying the '104 patent or the '959 patent would render them inoperable for

their intended functions, there is no motivation to modifying them, as described in the preceding paragraphs.

In conclusion, Applicants respectfully point out that a prima facie case of obviousness has not been established.

In view thereof, the Examiner's utilization of the above references under 35 U.S.C. 103 is no longer applicable and should be withdrawn.

In conclusion, in view of the above remarks, Applicants respectfully request the Examiner find claims 1,3-7, 9-13, 15-18 allowable over the prior art. Since, based on the arguments presented herein above, added Claims 19-24, which are dependent on claims 3, 9 and 15 respectively, are not anticipated or obvious in view of the prior art, Applicant respectfully requests the Examiner find the claims allowable and pass this case to issue.

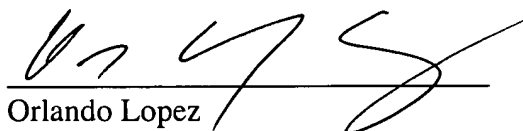
Payment of \$129.00 due to the three additional independent claims is enclosed. Any additional required fees should be charged to Deposit Account No. 03-2410, Order No. 6536-109 and any overpayment should be credited to this account.

In accordance with Section 714.01 of the M.P.E.P., the following information is presented in the event that a call may be deemed desirable by the Examiner:

ORLANDO LOPEZ (617) 854-4000

Dated: June 1, 2004

Respectfully submitted,
Thomas W. Stone, Applicant

By: 
Orlando Lopez
Reg. No. 46,880
Agent for Applicant